

Manufacturers' Inventory and Sales Expectations

A Progress Report on a New Survey

IN THE fall of 1957, after a decade of successful experience with the survey of businessmen's plant and equipment expenditure anticipations, this Office initiated an exploratory survey of manufacturers' sales and inventory expectations. A major purpose was to determine whether the survey approach, based on businessmen's expectations, could yield reasonably accurate short-run forecasts of changes in inventories. In addition, it was felt that the survey might shed more light on the behavior of inventories and the role of expectations over the business cycle.

Since that time 11 surveys have been conducted in which anticipations can be compared with actual experience. This article describes what has been undertaken and tentatively evaluates the results to date, with attention focused on the overall totals. The approach and results should be viewed as preliminary since the time period encompassed by the surveys is very short, and was affected by the 1959 steel strike.

It was realized that the problem of obtaining reasonably reliable projections of inventories was a difficult one. Short-run sales expectations and departures from them play an important role in inventory shifts; but as has been frequently pointed out in connection with the annual investment and sales surveys, businessmen have only limited control over the course of their sales. Moreover, comparatively small tolerances are required for the anticipations. With manufacturers' inventories around \$55 billion, each one-percent change during a quarter, for example, is the equivalent of a change of more than \$2 billion at an annual rate.

In the latest survey of manufacturers' inventory and sales expectations, businessmen have projected a seasonally adjusted increase of \$1 billion (\$3.5 billion before correction for understatement), in the book value of their stocks during the third quarter, with durable goods industries accounting for about two-thirds of the advance. Manufacturers' stocks were reduced by \$4 billion during the first quarter and were about unchanged in the second.

Manufacturers expect their sales to increase 4 percent in the third quarter, extending the rise that began earlier in the year. A rise is anticipated by both durable and nondurable goods producers.

Manufacturers holding about one-fifth of the value of inventories characterized their stocks as high at the start of the second quarter, a ratio which is lower than the average reported since the fall of 1957. Almost all the remainder viewed stocks as about right relative to sales and unfilled orders.

Summary

The record of inventory anticipations, as initially reported, whether quarterly or semiannually, has generally not been satisfactory, displaying a basic understatement. However, favorable results have been obtained thus far by correcting the reported inventory expectations for the apparent bias, through the use of supplementary information. The added information pertains to data reported in the survey on the condition of inventories relative to sales and unfilled orders. The amount of the correction varies over the inventory cycle—suggesting appreciable additions to the anticipation when stocks are relatively low, and downward adjustments when stocks are relatively very high.

At the present time it is intended to publish seasonally adjusted survey results quarterly both on the reported and corrected basis. It should be emphasized, however, that additional observations are necessary for a more conclusive determination of the need for, and the form of, correction factors for systematic tendencies in inventory anticipations.

The sample and the questionnaire

The businessmen's projections presented here, which are tied to the regularly published Department of Commerce monthly data on sales and inventories (Industry Survey), are based on a sample of about 1250 to 1400 manufacturing corporations, whose inventories account for over 55 percent of the value of all manufacturers' inventories. The sample consists of most manufacturing companies with assets of \$10,000,000 or more, and a small sample of firms under that size.

The first three surveys were run on a 6-month basis. The first survey, for example, which was sent out in late October 1957, asked companies to report their actual inventory book values on September 30, 1957 and the value of inventories that they expected to hold on March 31, 1958. Actual sales were requested for the third quarter of 1957, and expected sales for the first quarter of 1958. In addition, each company was requested to characterize its total inventories on September 30, 1957—in view of its total sales and unfilled orders position—as "high," "about right," or "low."

Starting with the fourth survey, in the spring of 1959, questions pertaining to quarterly anticipations were added to the schedule. At this time companies reported actual March 30, 1959 inventories, and expected inventories on June 30 and September 30 of the same year; comparable quarterly sales figures were also given. Thus like the plant and equipment survey we now obtain for a given quarter, from successive surveys reported at 3-month intervals, a first anticipation, a second anticipation and an actual.

Sales Anticipation

Because of the central role played by the sales forecast in companies' future operating plans, attention is focused initially on the realization of sales anticipations. The first chart presents a comparison of anticipated changes in sales with actual changes, seasonally adjusted, for all manufacturing firms combined. The top panel refers to changes from the most recent actual calendar quarter, at the time the anticipations are reported, to the next quarter. The bottom panel refers to changes over a 6-month period. Table 1 gives corresponding data including averages of actual and anticipated changes and deviations.¹ All seasonal adjustments of sales (and inventories) were made by this Office.

The main points brought out by the chart and table are these: (1) Measured by size of percent deviation disregarding signs the one-quarter anticipations show a better record than the 6-month, as might be expected. (2) Misses in direction of change have occurred twice with the one-quarter forecast and almost half the time with the 6-month projections. Aside from the latter part of 1959, when the steel strike was in effect, the misses are associated with the recession periods. (3) In most instances actual sales have fallen short of expectations, although this phenomenon may reflect the time period covered.

There has never been a projection of an overall sales decrease over a 6-month period, though this is not true of the shorter anticipations. Conceivably this reflects a bias in the sales expectations—an unwillingness by businessmen to report a deteriorating sales outlook for a period as long as a half-year at the onset of the recession. However, given the brevity of the postwar recessions and the lag between the availability of data and actual events, the existence of such a bias is not conclusive.

First and second anticipations compared

Starting with the third quarter of 1959 we can compare first and second anticipations of sales with actual for

¹ The deviation is defined as follows: (Anticipated minus actual sales) ÷ (Actual sales).

eight successive quarters. The record of the first anticipation is not good. Note, however, that the second anticipation, given the first, always moves toward the actual and is always superior to the first. The data are shown below in terms of seasonally adjusted percent changes from the preceding quarter:

| | Anticipation | | Actual |
|-----------------------|--------------|------|--------|
| | 1st | 2d | |
| 3d quarter 1959..... | 1.3 | -2.2 | -2.5 |
| 4th quarter 1959..... | 3.0 | -2.1 | -1.9 |
| 1st quarter 1960..... | 0.2 | 6.2 | 4.0 |
| 2d quarter 1960..... | 1.0 | -1.2 | -0.8 |
| 3d quarter 1960..... | 2.7 | -1.1 | -2.3 |
| 4th quarter 1960..... | 1.8 | .6 | -3.0 |
| 1st quarter 1961..... | 1.4 | .6 | -1.8 |
| 2d quarter 1961..... | 3.0 | 4.8 | 6.3 |
| 3d quarter 1961..... | 3.0 | | |

Inventory Anticipations

An examination of the reported inventory anticipations reveals that frequently these projections have appeared to be understating sizably the amount of inventory change or even moving in the wrong direction from the movement shown by the actual monthly figures available at the time of the forecast. With two exceptions the level of actual inventories has always exceeded the anticipated values. On the average actual stocks have exceeded anticipated stocks by 2.1 percent for the 6-month projections and by 1.7 percent for the one-quarter projections.

The one-quarter forecast was added to the survey on the assumption that the accuracy of the projections would improve as the time span was shortened. This turned out to be the case with sales, but not with inventories.

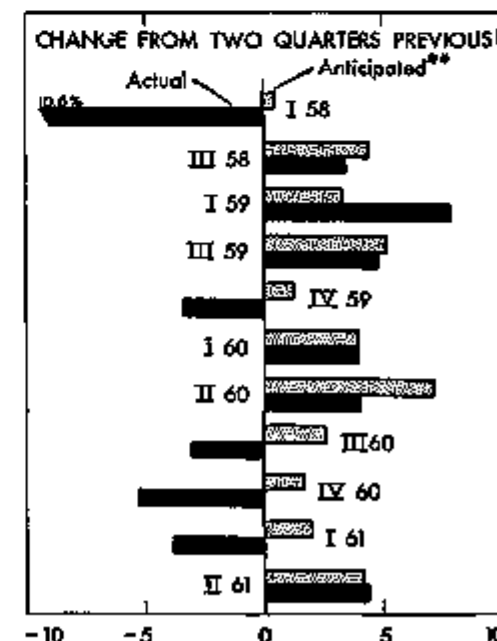
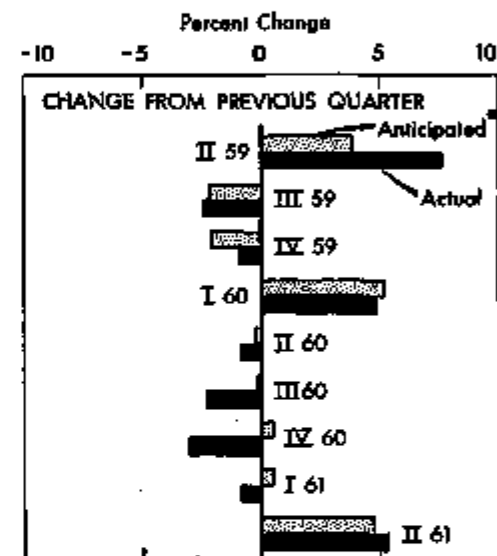
First vs. second inventory anticipations

A comparison of first and second anticipations with actual since the third quarter of 1959 indicates that the second anticipation, although submitted 3 months after the first, is far less accurate than the first in 4 out of 8 cases and shows no clearcut superiority in the remaining instances. While it is possible that the business outlook had changed in such a fashion that the second anticipation was indeed a more reasonable figure at the time of submission, on the average one should

expect that the closer the projected period, the closer the forecasts should be to the actual. At the very least, even though it may overshoot the mark, the second anticipation should move in the direction of the actual.

Apparent inconsistencies of this nature have been encountered before in surveys of businessmen's anticipations. In the OBE-SEC quarterly survey of plant and equipment expenditure anticipations, it has been found that prior to correction for systematic under- or overstatement in anticipatory

Sales Anticipations Reported by Manufacturers Compared with Actual



* Based on anticipations reported early in the quarter.

** Based on anticipations reported early in previous quarter.

data, the second or later anticipation for a given quarter has yielded a poorer forecast of actual than the first.² Since mid-1952, however, a successful technique has been used by OBE to correct these errors.³

During the course of this survey, and particularly in the more recent period because of the increased number of observations, tests were run in an attempt to account for the differences between actual and anticipated inventories as reported. The overall reported inventory anticipation was not markedly improved through relationships with sales deviations, or by making allowances for price changes. An assumption that the inventory projections are made in seasonally adjusted terms was not borne out. More conclusive tests require further aggregative observations as well as intensive detailed analysis. A more extended discussion of the shortcomings of the raw survey results is given below.

Condition of Inventories

One of the by-products of this survey has been the development of a new and useful set of statistics pertaining to businessmen's views on the condition of actual inventories relative to sales and unfilled orders position at the start of the forecasting period. While the questionnaire has not asked for an evaluation of stocks relative to expected sales, it should be kept in mind that unfilled orders reflect to some extent sales in the future.

Total inventories of each respondent firm are classified once in one of three classifications: "high," "about right" or "low"; about 95 percent of the sample firms provide answers to this question. Percent distributions based on these data are shown in table 2.

The relative proportions of "high" stocks show fairly marked changes over the period covered, and are roughly in line with shifts in the stock-sales ratio; both measures move inversely with business activity over the cycle.

Over this period relatively few firms have classified their stocks as "low,"

despite some sizable increases in inventories. At the moment it is too early to say whether the comparative absence of "low" designations is an accurate portrayal of business sentiment regarding inventory conditions over this period, or whether it is the inevitable result of business thinking which always attempts to keep stocks as small as possible and thus classifies stocks as "about right" so long as they are obviously not high.

If such a tendency is widespread, the figures in table 2 can perhaps be better used in an adjusted form. We can obtain an average of the high proportions, for example, and express the high proportion at any given time period relative to the average. On this basis, stocks were high at the end of September 1957, March 1958, and March and June 1960, and relatively low at the end of March and September 1959 and March 1961.

Relationship of inventory condition to inventory change

Condition of inventories at the start of the forecast period appears to have an important influence on the size of both the projected and actual change in inventories. Table 3 presents averages of anticipated percent change in inventories, cross-classified with inventory condition; these data, based on all surveys, are not adjusted for seasonal variation. The group of firms with high stocks almost invariably anticipates inventory reductions over the short-run. Furthermore, they project smaller increases or larger decreases than do firms whose stocks are judged to be about right. The pattern which shows up in almost all the surveys is reflected in the averages: the "high" and "low" firms are in the extreme positions while the "about right" companies are in the middle.

Thus far a number of tabulations have also been made of actual change in inventories classified by inventory condition for the reporting firms. The actual changes show the same pattern that is evident in the anticipated changes—the high and low firms are at the extremes with the latter showing either larger increases or smaller reduc-

Table 1.—Seasonally Adjusted Changes in Manufacturers' Sales Anticipated and Actual, and Percent Deviation

| | Anticipated percent changes | Actual percent changes | Percent deviation ¹ |
|--|-----------------------------|------------------------|--------------------------------|
| Geo-Quarter Changes² | | | |
| I Q. 1959–II Q. 1959 | 3.0 | 7.6 | -3.4 |
| II Q. 1959–III Q. 1959 | -2.2 | -2.5 | -.3 |
| III Q. 1959–IV Q. 1959 | -2.1 | -.9 | -1.3 |
| IV Q. 1959–I Q. 1960 | 5.2 | 4.9 | .3 |
| I Q. 1960–II Q. 1960 | -1.2 | -.8 | -.6 |
| II Q. 1960–III Q. 1960 | -1.1 | -2.3 | 2.2 |
| III Q. 1960–IV Q. 1960 | .6 | -3.0 | 3.6 |
| IV Q. 1960–I Q. 1961 | .6 | -.8 | 1.4 |
| I Q. 1961–II Q. 1961 | 4.8 | 5.3 | -.4 |
| Mean | | | |
| Disregarding signs (absolute) | 2.3 | 3.1 | 1.5 |
| With regard to signs | 1.1 | .8 | .4 |
| 6-Month Changes | | | |
| III Q. 1957–I Q. 1958 | .6 | -10.5 | 12.2 |
| I Q. 1958–III Q. 1958 | 4.5 | 3.5 | 1.0 |
| III Q. 1958–I Q. 1959 | 3.3 | 7.9 | -4.5 |
| I Q. 1959–III Q. 1959 | 5.2 | 4.9 | .3 |
| III Q. 1959–I Q. 1960 | 1.3 | -3.4 | 4.8 |
| I Q. 1960–III Q. 1960 | 4.0 | 4.6 | -.6 |
| III Q. 1960–I Q. 1961 | 7.2 | 4.1 | 3.1 |
| I Q. 1961–III Q. 1961 | 2.0 | -3.0 | 5.0 |
| III Q. 1961–I Q. 1962 | 1.7 | -5.2 | 7.2 |
| I Q. 1962–III Q. 1962 | 2.0 | -3.6 | 5.6 |
| III Q. 1962–I Q. 1963 | 4.2 | 4.4 | -.2 |
| Mean | | | |
| Disregarding signs (absolute) | 2.3 | 5.0 | 4.1 |
| With regard to signs | 2.3 | .8 | 3.2 |

¹ Derived from indexes. (Anticipated-Actual) ÷ Actual.
² Second anticipation.

Table 2.—Condition of Manufacturers' Inventories

(Percent distribution of inventory book values according to company's classification of overall inventory condition)

| | High | About right | Low | Total | Percent "High" less percent "Low" |
|-------------------------|------|-------------|-----|-------|-----------------------------------|
| All industries | | | | | |
| Sept. 30, 1957 | 37 | 61 | 2 | 100 | 35 |
| Mar. 31, 1958 | 46 | 52 | 2 | 100 | 44 |
| Sept. 30, 1958 | 24 | 73 | 4 | 100 | 20 |
| Mar. 31, 1959 | 18 | 70 | 0 | 100 | 18 |
| June 30, 1959 | 23 | 71 | 0 | 100 | 23 |
| Sept. 30, 1959 | 19 | 71 | 11 | 100 | 7 |
| Dec. 31, 1959 | 22 | 72 | 6 | 100 | 16 |
| Mar. 31, 1960 | 31 | 67 | 2 | 100 | 29 |
| June 30, 1960 | 35 | 63 | 2 | 100 | 33 |
| Sept. 30, 1960 | 20 | 70 | 1 | 100 | 19 |
| Dec. 31, 1960 | 28 | 71 | 1 | 100 | 27 |
| Mar. 31, 1961 | 22 | 77 | 1 | 100 | 21 |
| Durable goods | | | | | |
| Sept. 30, 1957 | 38 | 60 | 2 | 100 | 36 |
| Mar. 31, 1958 | 47 | 52 | 1 | 100 | 46 |
| Sept. 30, 1958 | 20 | 69 | 5 | 100 | 15 |
| Mar. 31, 1959 | 20 | 75 | 5 | 100 | 15 |
| June 30, 1959 | 20 | 64 | 7 | 100 | 13 |
| Sept. 30, 1959 | 21 | 64 | 15 | 100 | 6 |
| Dec. 31, 1959 | 25 | 68 | 7 | 100 | 18 |
| Mar. 31, 1960 | 39 | 60 | 1 | 100 | 38 |
| June 30, 1960 | 42 | 57 | 1 | 100 | 41 |
| Sept. 30, 1960 | 36 | 63 | 1 | 100 | 35 |
| Dec. 31, 1960 | 32 | 67 | 1 | 100 | 31 |
| Mar. 31, 1961 | 21 | 76 | 1 | 100 | 20 |
| Nondurable goods | | | | | |
| Sept. 30, 1957 | 36 | 62 | 2 | 100 | 34 |
| Mar. 31, 1958 | 44 | 53 | 3 | 100 | 41 |
| Sept. 30, 1958 | 20 | 77 | 3 | 100 | 17 |
| Mar. 31, 1959 | 14 | 80 | 6 | 100 | 8 |
| June 30, 1959 | 14 | 69 | 0 | 100 | 14 |
| Sept. 30, 1959 | 14 | 81 | 5 | 100 | 9 |
| Dec. 31, 1959 | 20 | 78 | 2 | 100 | 18 |
| Mar. 31, 1960 | 20 | 77 | 3 | 100 | 17 |
| June 30, 1960 | 24 | 71 | 5 | 100 | 19 |
| Sept. 30, 1960 | 20 | 76 | 2 | 100 | 18 |
| Dec. 31, 1960 | 22 | 77 | 1 | 100 | 21 |
| Mar. 31, 1961 | 19 | 80 | 1 | 100 | 18 |

¹ See SURVEY OF CURRENT BUSINESS, January 1957, pp. 18-19.

² See SURVEY OF CURRENT BUSINESS, August 1962, p. 10.

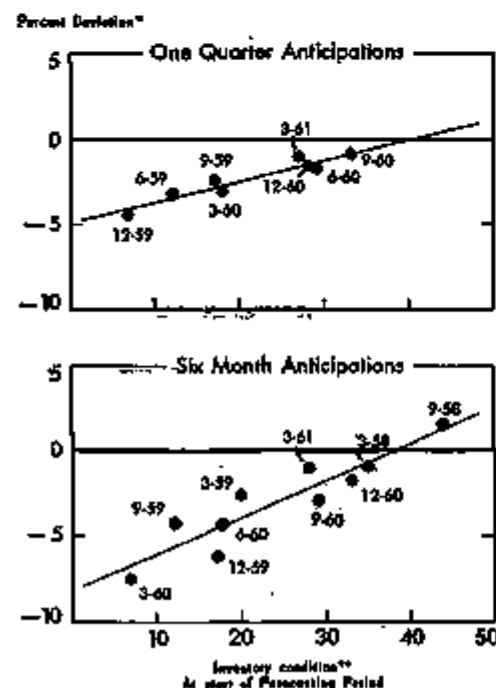
tions. In addition, the actual change tends to exceed the anticipated change—an indication of the understatement common to the expectations data.

As another aspect of the above, we find that the actual seasonally adjusted inventory changes over a 6-month period are highly correlated with inventory condition at the start of the period for all manufacturing firms. The one-quarter relationship was not so good, but in both instances the projections obtained from these simple relationships are greatly superior to anticipations directly reported for the corresponding periods. The inventory condition was quantified by use of the final column in table 2.

Derivation of corrected anticipations

With inventory condition apparently related to both anticipated and actual change, a test was made to see if the differences between actual and anticipated inventories also bore some relationship to inventory condition. In each panel of the second chart the percent deviation in inventories—

Deviations Between Anticipated and Actual Inventories Related to Inventory Condition at Start of Forecasting Period



* (Anticipated minus actual inventories) ÷ (actual inventories)

** Proportion of stocks (stock values) viewed high minus proportion viewed low

defined as (anticipated minus actual inventory) ÷ (actual inventory)—is measured along the vertical axis. Inventory condition at the start of the forecast period is measured by the "high" minus the "low" percentages shown in the last column of table 2, and is plotted along the horizontal axis. While conceptually it may be preferable to use each category separately in a multiple correlation, in this article we have used the high minus the low percentage, which yields a kind of net high percentage.⁴

The top panel of the chart is referred to as a one-quarter relationship and is based on changes from the beginning to the end of the same quarter; the eight surveys included in it are those for which we can make a direct comparison of actual and anticipated inventories from matched companies in the sample. Ten observations are available for the second, or 6-month relationship.

The first relationship yields an r^2 of .99; for the second, $r^2 = .85$; both correlation coefficients are highly significant. It may be noted that the two relationships have the same general form but that the 6-month relationship has the steeper slope and larger negative constant.

We can see from the relationships not merely an understatement in anticipated inventories relative to actual (the deviation), but also a systematic variation in the relative understatement over the inventory cycle. According to the relationship, when stocks are low, the understatement is comparatively large. As stocks rise, the understatement becomes progressively smaller, so that when stocks are very high (as they were in early 1958), anticipations tend to exceed actual inventories.

The anticipations reported in each survey have been corrected by the use of relationships like those indicated above. Statistically the correction simply involves adjusting the reported anticipations by a constant percentage, and a variable percentage that becomes smaller as inventories become relatively higher. Except when stocks are very

Table 3.—Average Anticipated Percent Changes in Manufacturers' Inventories by Condition of Inventories at Start of Period

| Inventory condition at beginning of period | Average anticipated percent change in inventories | | |
|--|---|---------|------------|
| | Total | Durable | Nondurable |
| One-quarter changes | | | |
| High..... | -3 | -3 | -3 |
| About right..... | -2 | -1 | 0 |
| Low..... | 4 | 4 | 3 |
| 6-month changes | | | |
| High..... | -5 | -5 | -5 |
| About right..... | -1 | -1 | 0 |
| Low..... | 7 | 7 | 8 |

NOTE.—Averages for one-quarter changes are based on 9 surveys; for 6-month changes, on 12 surveys. The number of observations in the "low" category is almost always very small.

high the net effect of this adjustment is to raise the anticipation.

Why should this understatement of expected inventories exist and vary in the above fashion? At this stage we can only suggest some reasons. One possibility may be related to the very difficulty that businessmen experience in gauging future inventories. As a consequence, they may resort to mechanical methods of projecting, with the projected change in stocks being related to recent actual changes over year-ago figures. Such a technique can give rise to misses at turning points and estimates of change that are too small in both directions.

Another and possibly associated explanation may be related to the manner in which business firms view their inventories. It will be recalled that few firms classify stocks as "low" despite the large actual changes that have subsequently occurred. It may also be noted from table 3 that firms designating their stocks as "about right" project changes close to zero; the average changes are about -1 percent without seasonal adjustment. These characteristics may be indications of a fundamentally conservative attitude toward inventories, which fails to take account of the increased stocks that are required for higher levels of sales and output. Since the proportion of firms viewing stocks as about right tends to vary over the business cycle, the understatement attributable to this type of attitude toward inventories will similarly vary.

⁴ Multiple correlations using the high and low proportions as independent variables gave results quite similar to those illustrated. The independent variables were significant at the 5 percent level.

Table 4.—Changes in Seasonally Adjusted Manufacturers' Inventories: Anticipated as Reported and Corrected, and Actual

(In billions of dollars)

| | Anticipated change | | Actual change |
|--|--------------------|--------------|---------------|
| | As reported | As corrected | |
| I One-Quarter Changes¹ | | | |
| Mar. 1949-June 1959 | 0.3 | 1.8 | 1.7 |
| June 1959-Sept. 1959 | -1.1 | .2 | -2.2 |
| Sept. 1959-Dec. 1959 | -1.1 | .7 | .5 |
| Dec. 1959-Mar. 1960 | .4 | 1.0 | 1.0 |
| Mar. 1960-June 1960 | -4 | .2 | .8 |
| June 1960-Sept. 1960 | -6 | -2 | -4 |
| Sept. 1960-Dec. 1960 | -1.7 | -1.0 | -1.0 |
| Dec. 1960-Mar. 1961 | -9 | -3 | -4 |
| Mar. 1961-June 1961 | -4 | .6 | 0 |
| II 6-Month Changes | | | |
| Sept. 1957-Mar. 1958 | -1.8 | -1.7 | -2.2 |
| Mar. 1958-Sept. 1958 | -1.8 | -2.4 | -2.7 |
| Sept. 1958-Mar. 1959 | -1.3 | 1.8 | 1.2 |
| Mar. 1959-Sept. 1959 | -2 | 2.2 | 1.4 |
| June 1959-Dec. 1959 | -2.0 | -1 | .2 |
| Sept. 1959-Mar. 1960 | -8 | 2.2 | 2.4 |
| Dec. 1959-June 1960 | -3 | 2.2 | 2.7 |
| Mar. 1960-Sept. 1960 | -1.1 | -6 | -4 |
| June 1960-Dec. 1960 | -1.9 | -1.8 | -1.4 |
| Sept. 1960-Mar. 1961 | -1.8 | -1.1 | -1.3 |
| Dec. 1960-June 1961 | -1.4 | -5 | -4 |
| Mar. 1961-Sept. 1961 | -1 | 1.7 | |

¹ Second anticipation.

Corrected anticipations vs. actual

Table 4 shows for each survey, in terms of seasonally adjusted dollar changes, the anticipated change as reported, the anticipated change after correction, and the actual change.

The corrected totals were obtained in the following manner. Relationships similar to those shown in the chart were derived separately for durable goods and nondurable goods; corrected components were then added to obtain totals for all manufacturing. A further adjustment was needed because of the fact that the actual movements shown by the samples of firms supplying anticipations differ to some degree from the movements shown by the regularly published monthly inventory data, due to lesser coverage of small firms, failure of a few very large firms to cooperate in the survey, fiscal quarter endings that differ from calendar quarters, etc. It was found that the actual changes shown by the anticipations survey sample tended to exceed those of the Industry Survey by \$0.2 billion on a 3-month basis, and \$0.5 on a 6-month basis, the differences being about equally divided between durables and nondurables. These average amounts were thus subtracted from the data after the initial correction to yield the corrected

figures shown in table 4. Naturally some forecasting accuracy is lost by such a procedure but this is unavoidable so long as the samples differ and it is desired to tie all anticipations to Industry Survey actual totals.²

Of 20 comparisons with actual that are possible in table 4, in only 2 cases does the corrected figure fail to come closer to actual than does the uncorrected figure. Whereas the uncorrected figures miss direction of change four times for the 6-month anticipation there are only two misses after correction, one being extremely small. The record on direction of change is also better for the one-quarter change, though the more striking feature with the one-quarter changes is in the amount of the correction.

Deriving "first" anticipations

By combining the results of the two relationships it is possible to derive an early or first anticipation after correction for each of the quarters starting with the third quarter of 1959. These data, in terms of seasonally adjusted dollar changes from beginning to the end of quarter, are compared with second anticipations and actuals below:

| | 1st anticipation | 2d anticipation | Actual |
|------------------|-----------------------|-----------------|--------|
| | (Billions of dollars) | | |
| 3d quarter 1959 | 0.8 | 0.2 | -0.2 |
| 4th quarter 1959 | -8 | .7 | .5 |
| 1st quarter 1960 | 1.5 | 1.6 | 1.0 |
| 2d quarter 1960 | .0 | .2 | .2 |
| 3d quarter 1960 | -8 | -3 | -4 |
| 4th quarter 1960 | -1.5 | -1.0 | -1.0 |
| 1st quarter 1961 | 0 | -3 | -4 |
| 2d quarter 1961 | -2 | .0 | 0 |
| 3d quarter 1961 | 1.1 | ----- | ----- |

Six of the 8 first anticipations show up very well. The only appreciable errors are found in the anticipations for the last two quarters of 1959, the period during which the steel strike took place. The comparison between the corrected first and second anticipations is particularly instructive. Given the first anticipation, the second moves toward the actual in all but one case—in marked contrast with the pattern of the uncorrected inventory expectations. Second anticipations after correction are closer to actual than are first in 6

² The separate figures for durables and nondurables underlying table 4 may be obtained on request.

out of 8 cases. This result is what should be reasonably expected and, interestingly, is exactly what has occurred in the quarterly plant and equipment survey after correction for systematic over- and understatement.

Further Consideration of Sales Deviations

Thus far the relation between sales deviations and inventory deviations has been ignored, aside from mention of some preliminary tests which showed a low correlation when deviations from uncorrected inventory anticipations were related to departures from sales forecasts. After correction, however, there is evidence of an inverse relationship, that is, higher than expected inventories are associated with lower than expected sales. The relationship appeared to hold for the 6-month sales forecast but not for the one-quarter sales projection.

Another aspect of sales deviations is concerned with inventory condition. If we relate inventory condition for total manufacturing at the end of a given quarter to the realization of sales expectations for the same quarter, we find a fairly good and significant relationship. The more sales fall short of expectations, the greater the proportion of stocks that are judged "high" by businessmen. To a large extent, then, inventory condition is a mirror of how actual sales in the recent past have turned out relative to expectations. Very tentatively it appears that the relationship between sales deviations and inventory condition is much better gauged by the 6-month sales data than by the one-quarter figures.

Concluding remarks

The tentative character of the results presented here must be kept in mind. While the results of the correction technique are promising, it remains to be seen whether the correction will work out in the future when circumstances may be different. In particular, it is desirable to determine reasons for the apparent biases in the anticipations. In the meantime, of course, more careful consideration by business to inventory and sales anticipations in this survey should enhance the value of the survey results.